

***Interactive comment on* “The effect of aerosol on surface cloud radiative forcing in the Arctic” by R.-M. Hu et al.**

Anonymous Referee #3

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The authors report on the simulations they have made using a GCM-regional model to address the cloud radiative forcing in the Arctic.

Specific comments: There is a need for clarification in most of the figures presented, and discussion associated with the figures.

1. Figure 1 is the results of a single column model (SCM), but which SCM? There is no mention on how the SCM is run, and what elements from the host GCM are included.
2. Are Fig. 2 and 3 annual average? seasonal average?
3. If the authors have the access to the observed surface albedo, why didn't you use it? It is apparently that the discrepancies in SW and LW fluxes between the model results

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and observations especially in Summer is largely due to the surface albedo differences. The difference ((obs-model)/obs) is as large as 40% during summer between day 530-550. Unlike what the authors claim that there is a good agreement in Fig. 5.

4. Are Fig. 6, 7, and 8 areal average? over what area? Clarify.

5. The plot in Fig. 11 is off scale, and doesn't agree with the same field in Fig. 12. Clarification is needed. If they are the same field, they should agree.

6. In Fig.12 and the conclusion: the authors need to discuss how you arrived at the -6 W/m² value from the model results, and how this value compares with observations if available.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 9039, 2005.

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